

Bertholt-Brecht-Gymnasium

Dresden, Germany

51,1°N, 13,4°E

predominantly cloudy

bilateral daylight strategy with atrium



building

The Bertholt-Brecht-School represents a standard school building that was replicated in the area of Dresden about 180 times. The school consists of two parallel blocks connected by three corridor-bridges. Before refurbishment, the courtyards were open. Retrofitting the building resulted from the necessity to reduce the high energy consumption, provide common spaces and to repair various mechanical systems.



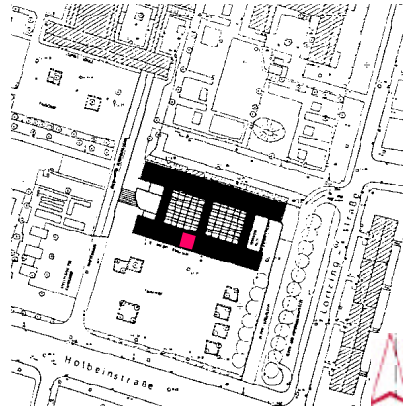
daylight strategy

Covering the courtyards was one of the major efforts in this project. The new atriums serve as common spaces, while the new glass roof improves the surface/volume ratio of the building. Supply air for the classrooms is now preheated in the atria. The thermal insulation of the facades has been improved. An extension containing rooms for natural science was added as well. The atria are shaded by movable horizontal fabrics. Most of the time the sunlight only hits the circulation spaces that surround the atria, so the primary function of the shading device is to prevent overheating. Because the shading can only be controlled manually by the building operator, the fabrics tend to remain closed throughout the whole summer, reducing daylight to the classrooms significantly.

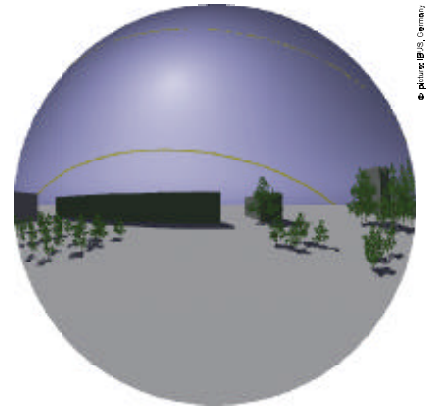


classroom

The classrooms are in the southern block of the building. They have big windows facing the playground in the South and clerestory windows to the atrium in the North. The south windows are equipped with exterior louvre blinds that can be manually controlled.



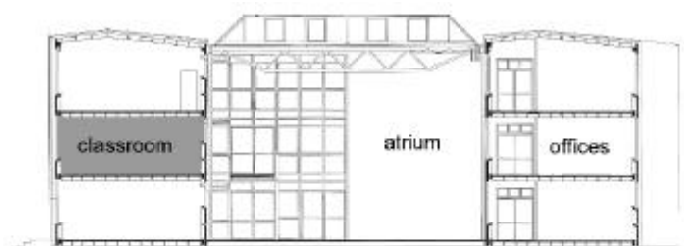
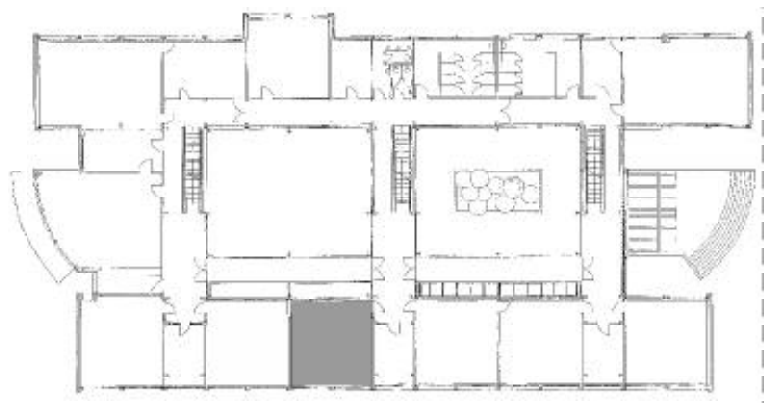
The Bertholt-Brecht-School is located in an urban environment of low density.



The south facing classroom window is only slightly obstructed.



Western atrium of the Berthold-Brecht-highschool under an overcast sky. The windows on the left are the clerestory windows of the classrooms.



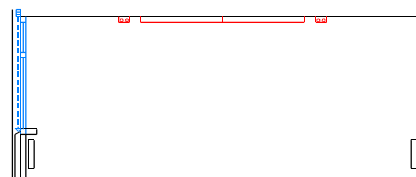
Floorplan of the second floor and cross-section of the Berthold-Brecht-highschool.



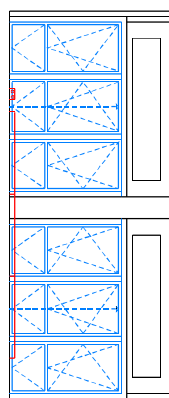
Interior view of a classroom on a sunny day.



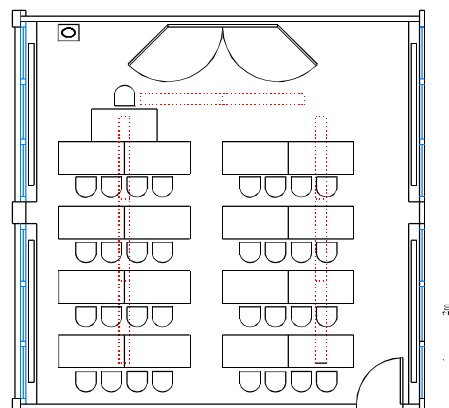
Skylights of the atrium in the Bertolt-Brecht-School. The opening coefficient of the atrium roof is 0,49.



cross-section



window wall



plan

building data

size	1900 m ²
number of stories	3
architect	IBUS (retrofit)
daylight consultant	TUB, Roman Jakobiak
year of completion	1996 (retrofitting)

classroom

daylight strategy	bilateral, sidelighting
dimensions (depth/width/height)	7,2 m / 7,0 m / 3,0 m
room area	50 m ²
floor	linoleum, 24%
wall	pale yellow paint, 62%
door	painted timber, 23%
ceiling	white paint, 66%
table	timber veneer, 24%
blackboard	green coating, 11%
south facing window	double, low-e
north facing window	double, low-e
lamp types	fluorescent lamps
installed power density	19 W/m ²
control strategy	manual switching

facade		South-facade	atrium facade (North)
data	orientation	196°	16°
	glazed area	11,2 m ²	8,4 m ²
	opening index	0,53	0,4
function	daylighting	☐	●
	view outside	☐	●
	ventilation	☐	●
	operable	☐	●
	shading	☐	-
	redirection	☐	-
systems		horiz. lower blinds	none
function	sun shading	●	
	glare protection	●	
	redirection	-	
location	inside	-	
	window pane	-	
	outside	●	
	movable	●	
location	fixed	-	